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10/808,405

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01/23/2006

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EXAMINER

QI, ZHI QIANG

ART UNIT

PAPER NUMBER

2871

DATE MAILED: 01/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/808,405

Applicant(s)

IIJIMA ET AL.

Examiner

Mike Qi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 December 2005.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6, 8 and 10-12 is/are rejected.
- 7) ☒ Claim(s) 5, 7 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/25/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

The previous restriction requirement has been withdrawal.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-4 and 10 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,501,521 B2 (Matsushita et al).

Regarding claim 1, Matsushita discloses (col.7, line 56 – col.9, line 50; Figs.1-3) that a transfective liquid crystal display device comprising:

- a pair of substrates (4, 12) composed on an upper of substrate (4) and a lower substrate (12) that face each other;
- a liquid crystal layer (8) interposed between the pair of substrates (4,12);
- electrodes (5a, 5b), which are provided on the pair of substrates (4,12), respectively, that drive the liquid crystal layer;
- a reflection layer (11), which is partially provided on an inner surface of the lower substrate (12), that reflects light incident from the upper substrate (4);
- color filters (10) provided above the reflection layer (11), in which coloring layers of different colors (10R,10G,10B) are arranged corresponding to sub-pixel region (R,G,B) that constitute a display region;

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- an illuminating device (151,161) provided below the external surface of the lower substrate (12);
- the transfective liquid crystal display device displaying image in a reflective region in which the reflection layer exists (see Fig.2-3, the reflective layer 11 having reflective region 11R, 11G, 11B) and in a transmissive region in which the reflection layer does not exist in every sub-pixel region (see Fig.2-3, the reflective layer 11 having openings as light-transmitting region 21R,21G,21B in which the reflection layer does not exist in every sub-pixel region R,G,B);
- colored regions (10) in which the coloring layers of the color filter exist (see Fig.2, the coloring layers having color filters 10R,10G,10B) and non-colored regions in which the coloring layer do not exist being provided in the reflective regions (see Fig.2, color filter 10 having openings 20R, 20G, 20B in which the coloring layers do not exist being provided in the reflective regions Re);
- both the colored regions (10R,10G,10B) and the non-colored regions (20R,20G,20B) being provided so as to overlap peripheries of the electrodes along a longitudinal direction of sub-pixel regions in plan view, because the electrodes (5a,5b) are formed by depositing and etching ITO on the substrates (4,12) each into a stripe pattern cross each other in matrix pattern (see col.12, lines 45-51), and the electrodeposition ITO film (Fig.2) overlapping the colored regions (10R,10G,10B) and the non-colored regions (20R,20G,20B) in plan view.

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Regarding claim 3, Matsushita discloses (col.7, line 56 – col.9, line 50; Figs.1-4) that a transfective liquid crystal display device in which the non-colored regions (20R,20G,20B) extending along a transverse direction on the sub-pixel region (R,G,B) in a strip shape (shown in Fig.4);

Regarding claim 4, Matsushita discloses (col.7, line 56 – col.9, line 50; Figs.1-4) that a transfective liquid crystal display device in which a plurality of the transmissive region (Tr) (Fig.2) being provided in the sub-pixel regions (R,G,B) so as to be separated from each other.

Regarding claim 10, Matsushita discloses (col.7, line 56 – col.9, line 50; Figs.1-4) that a transfective liquid crystal display device in which the reflection layer (11) being made of metal such as using aluminum (col.8, lines 46-49).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,824,935 B2 (Tanaka et al).

Regarding claim 2, Tanaka discloses (col.8, line 20 – col.9, line 60; Fig.1-2) that a transfective liquid crystal display device comprising:

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- a pair of substrates (4, 12) composed of an upper substrate (4) and a lower substrate (12) that face each other;
- a liquid crystal layer (8) interposed between the pair of substrates (4,12);
- electrodes (5), which are provided on the pair of substrates (4,12), respectively, that drive the liquid crystal layer;
- a reflection layer (11), which is partially provided on an inner surface of the lower substrate (12), that reflects light incident from the upper substrate (4);
- color filters (10) provided above the reflection layer (11), in which coloring layers of different colors (10R,10G,10B) are arranged corresponding to sub-pixel region (R,G,B) that constitute a display region;
- light shielding layers (7) that partition adjacent sub-pixel regions (R,G,B);
- an illuminating device (14) provided below the external surface of the lower substrate (12);
- the transfective liquid crystal display device displaying image in a reflective region in which the reflection layer exists (see Fig.1-2, the reflective layer 11 having reflective region) and in a transmissive region in which the reflection layer does not exist in every sub-pixel region (see Fig.1-2, the reflective layer 11 having openings 11a as light-transmitting region in which the reflection layer does not exist in every sub-pixel region R,G,B);
- colored regions (10) in which the coloring layers of the color filter exist (see Fig.2, the coloring layers having color filters 10R,10G,10B) and non-colored regions in which the coloring layer do not exist being provided in the reflective

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regions (see Fig.2, color filter 10 having openings 6 in which the coloring layers do not exist being provided in the reflective regions).

Although Tanaka does not show in the Figs.1-2 that both the colored regions and the non-colored regions are provided so as to overlap the light shielding layers along a longitudinal direction of the sub-pixel regions in plan view, Tanaka shows (col.20, line 3 – col.21, line 52; Fig.18) that the opening (10a) (non-colored region) of the colored layer (10) overlaps with the black matrix (7), and the black matrix (7) also overlaps the colored region (R,G,B) as shown in Fig.18A, such that both the colored regions and the non-colored regions are provided so as to overlap the light shielding layers along a longitudinal direction of the sub-pixel regions in plan view. Tanaka indicates (col. 20, lines 3-9 and col.21, lines 50 – 53) that such arrangements are set so as to ensure a proper alignment in the central portion of the substrate, therefore, there is no display chromaticity shift between the central portion and the edge portion of the substrate so as to realize a uniform display.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the transfective liquid crystal display device such as Figs.1-2 of Tanaka with the teaching of both the colored regions and the non-colored regions overlapping the light shielding layers as taught by Tanaka such as Fig.18, since the skilled in the art would be motivated for achieving a uniform display (col. 20, lines 3-9 and col.21, lines 50 – 53).

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5. Claims 6, 8 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsushita as applied to claims 1, 3-4 and 10 above, and further in view of US 6,630,970 B2 (Trapani et al).

Regarding claims 6 and 8, Matsushita teaches the invention set forth above.

Matsushita further teaches (col.16, lines 6-62; Fig.13) that the areas of the non-colored regions (20R,20G,20B) (openings in color filter 10) in the sub-pixel regions (R,G,B) are different; and the areas of the transmissive regions (21R,21G,21B) (openings in transmission regions Tr) in the sub-pixel regions (R,G,B) are different; so as to improve the reflected light and the transmitted light being a light of a desired white color (col.16, lines 31-40).

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the transfective liquid crystal display device of Matsushita with the teaching of having different areas of the non-colored regions and the transmissive regions in the sub-pixel regions as taught by Matsushita such as Fig.13, since the skilled in the art would be motivated for improving the reflected light and the transmitted light being a light of a desired white color (col.16, lines 31-40).

Regarding claim 11, Matsushita teaches the invention set forth above.

Matsushita further teaches (Fig.2) that the reflection film (11) is formed of minute slits as shown in Fig.2, and is formed of metal such as using aluminum (col.8, lines 46-49). As a general available knowledge, the reflection layer being constitute of a reflection polarization layer would simply the making process as using reflection polarization layer

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to perform reflection function and polarization function, and that would have been at least obvious.

As evidence, Trapani teaches (col.9, lines 54-61; Fig.12) that a polarizer structure (180) acts as a polarized mirror (reflection polarization layer) to reflect polarized light and enhance the brightness of the liquid crystal display.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to modify the transflective liquid crystal display device of Matsushita with the teaching of the reflection layer being constituted of a reflection polarization layer as taught by Trapani, since the skilled in the art would be motivated for enhancing the brightness of the liquid crystal display and simplifying the making process.

Regarding claim 12, any electronic apparatus can use the liquid crystal display that are only given weight as intended use, and that would have been at least obvious.

Allowable Subject Matter

6. Claims 5, 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter:

The prior art of record neither anticipated nor rendered obvious that a

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transflective liquid crystal display device comprises various elements as claimed, more specifically, as the following features:

a plurality of the transmissive regions being arranged in a zigzag shape over a plurality of the sub-pixel regions as shown in Fig.4 and as claimed in claim 5;

the area of the non-colored region (opening in color filter) corresponding to green layer being greater than the areas of the non-colored region corresponding the red layer and the blue layer as shown in Figs.1,3,4; and the area of the transmissive region (opening in reflection layer) corresponding to the green layer being smaller than the areas of the transmissive regions corresponding to the red layer and the blue layer as shown in Fig.4 and as claimed claims 7 and 9.

Conclusion

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (571) 272-2299.

The examiner can normally be reached on M-T 8:00 am-5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (571) 272-2293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Mike Qi
Patent examiner
January 17, 2006